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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
| 10/689,806 | 10/21/2003 | Dennis Brian Shea | 124858/GETS 5307.1 | 4367 |

321 7590 07/07/2004

SENNIGER POWERS LEAVITT AND ROEDEL
ONE METROPOLITAN SQUARE
16TH FLOOR
ST LOUIS, MO 63102

EXAMINER

TRIEU, THAI BA

ART UNIT

PAPER NUMBER

3748

DATE MAILED: 07/07/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

| | | | |
|------------------------------|--------------------------------------|------------------------------------|--|
| Office Action Summary | Application No. 10/689,806 | Applicant(s) SHEA ET AL. | |
| | Examiner Thai-Ba Trieu | Art Unit 3748 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
 - If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
 - If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
 - Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-34 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 18-22 and 34 is/are allowed.
- 6) ☒ Claim(s) 1,2,4-7,14-17,23-28,31 and 33 is/are rejected.
- 7) ☒ Claim(s) 3,8-13,29,30 and 32 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date <u>10/21/2003</u> . | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

Specification

Since the abstract is too long and contains 170 words, applicants are required to submit a substitute Abstract to meet the requirement set forth below:

Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet **within the range of 50 to 150 words**. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-2 are rejected under 35 U.S.C. 102(e) as being anticipated by Gladden (Patent Number 6,601,388 B1).

Regarding claims 1-2, Gladden discloses an apparatus for detecting and responding to a surge event in a locomotive engine system including a turbocharger and a diesel engine, the apparatus comprising:

a sensor (60) detecting an operating parameter of the turbocharger or the engine and generating a sensor signal indicative of the detected operating parameter; and

an engine control system (56) responsive to the sensor signal for controlling a plurality of operational controls of the diesel engine system, wherein the engine control system modifies one or more operational controls of the diesel engine system when the sensor signal indicates a surge event (See Figure 1, and Column 3, lines 15-22 and lines 42-66);

wherein the engine control system (56) controls a speed of the diesel engine and wherein the modified operational control is the speed of the diesel engine (See Column 3, lines 42-63).

Claims 7, 14-16, 25-28, 31 and 33 are rejected under 35 U.S.C. 102(e) as being anticipated by Sun et al. (Patent Number 6,647,723 B1).

Regarding claims 7 and 14-16, Sun discloses an apparatus for detecting operating parameters indicative of a surge event in a turbocharger of a locomotive engine system including a diesel engine and the turbocharger and controlling the operation of the engine system to reduce turbocharger surge, the apparatus comprising:

a sensor detecting an operating parameter of engine system indicative of a surge event and generating a sensor signal indicative of the detected operating parameter (See Column 3, lines 20-38); and

an engine control system (30) responsive to the sensor signal for controlling a speed of operation of the diesel engine (See Figure 1);

wherein when the engine system experiences a surge event, the engine control system increases the speed of the diesel engine to reduce turbocharger surge (See Figures 1-4, Column 4, lines 5-18, and Column 9, lines 9-26);

wherein the sensor is a manifold air pressure (MAP) transducer associated with an intake manifold of the diesel engine and the sensor signal is a MAP signal representing the air pressure within the intake manifold of the diesel engine, and wherein the engine control system increases the speed of the diesel engine when the MAP signal indicates a decrease in the air pressure of equal to or greater than a predefined amount of pressure within the defined period of time (See Column 6, lines 45-67, and Column 7, lines 1-5);

wherein the sensor is a turbocharger speed sensor that detects a rotational speed of the turbocharger and the sensor signal represents the rotational speed of the turbocharger and wherein the engine control system increases the speed of the diesel engine when the sensor signal indicates an increase in the turbocharger speed within a specified period of time (See Column 6, lines 1-14);

wherein the sensor is a pressure transducer associated with an air intake system of the turbocharger and the sensor signal represents an air pressure at the air intake system of the turbocharger, and wherein the engine control system increases the speed of the diesel engine when the sensor signal indicates an increase or decrease in the air pressure over time (See Column 2, lines 58-67, Column 3, lines 1-38, Column 6, lines 45-67, and Column 7, lines 1-5);

Regarding claims 25-28, 31 and 33, the method as claimed would be inherent during the normal use and operation of the Sun device as disclosed

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 4-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gladden (Patent Number 6,601,388 B1), in view of Bowman et al. (Patent number 6,415,606 B1).

Gladden discloses the invention as recited above; however, fails to disclose the engine control system controlling a horsepower rating of an electrical transmission

system, the modified operational control being load on the engine system, and the diesel engine driving an electrical transmission.

Bowman teaches that it is conventional in the turbocharged engine art, to utilize engine control system (30) controlling a horsepower rating of an electrical transmission system (16, 18), the modified operational control being load on the engine system, and the diesel engine (12) driving an electrical transmission (16, 18) with a generator (16) generating a Direct Current (DC) power signal; and a DC traction motor (18) coupled to an axle wheel set of the locomotive and responsive to the (DC) power signal for rotating the axle wheel set of the locomotive (via 14) (See Figure 1, Column 2, lines 49-67).

It would have been obvious to one having ordinary skill in the art at that time the invention was made, to have utilized the engine control system controlling a horsepower rating of an electrical transmission system, the modified operational control being load on the engine system, and the diesel engine driving an electrical transmission, as taught by Bowman, to improve the efficiency and the performance of the Gladden device.

Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Gladden (Patent Number 6,601,388 B1), in view of Friedlander et al. (Patent Number 5,929,610).

Gladden discloses the invention as recited above; however, Gladden fails to disclose the detailed structure of an electrical transmission.

Friedlander teaches that it is conventional in the turbocharged engine art, to utilize an electrical transmission comprising a generator generating a DC power signal;

an inverter for receiving the DC power signal and inverting the received DC power signal into an AC power signal an AC traction motor coupled to an axle wheel set of the locomotive and responsive to the AC power signal for rotating the axle wheel set of the locomotive (See Figure 1, Abstract, Column 1, lines 18-48, Column 2, lines 38-61, Column 4, lines 39-67, and Column 5, lines 47).

It would has been obvious to one having ordinary skill in the art at that time the invention was made, to have utilized the detailed structure of an electrical transmission, as taught by Friedlander, to improve the efficiency and the performance of the Gladden device.

Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sun et al. (Patent Number 6,647,723 B1), in view of Harned (Patent Number 4,012,942).

Sun discloses the invention as recited above; however, Sun fails to disclose the sensor being a strain gauge or an accelerometer associated with a surface of an air intake system.

Harned teaches that it is conventional in the internal combustion engine art, to utilize the sensor being a strain gauge or an accelerometer (10) associated with a surface of an air intake system (See Abstract, Column 2, lines 6-25).

It would has been obvious to one having ordinary skill in the art at that time the invention was made, to have utilized the sensor being a strain gauge or an accelerometer associated with a surface of an air intake system, as taught by Harned, to improve the Sun internal combustion engine efficiency and performance.

Claims 23-24 is rejected under 35 U.S.C. 103(a) as being unpatentable over Bowman et al. (Patent Number 6,415,606 B1), in view of Venema (Patent Number 4,309,871).

Bowman discloses a locomotive propulsion system comprising a variable-speed diesel engine system (12) having a combustion air intake manifold and an exhaust manifold (Not Numbered), a turbocharger (44, 48) connected to both of the exhaust and intake manifolds of the engine and having a turbine (44) that is driven by the engine exhaust gases and that in turn drives a compressor (48) for supplying pressurized air to the intake manifold, an engine speed sensor (Not Numbered) for sensing the speed of the engine, an electric power transmission system (16,18) mechanically driven by the engine, and an excitation controller (30 and 50) for controlling the power output of the transmission system (See Figure 1); further comprising:

a sensor (49) equipped to sense an operating parameter of the turbocharger or the engine and equipped to generate a sensor signal representing the sensed operating parameter (See Figure 1); and

a controller (30) adapted to receive the generated sensor signal for increasing the engine speed from a first discrete speed to another discrete speed for a predetermined period of time when a change in the sensor signal over time indicates a surge event (See Figures 1, 3 and 4, Column 3, lines 44-67, and Column 4, lines 1-18);

wherein the operating parameter includes one or more of the parameters:

manifold air pressure (MAP) (49), manifold air temperature (MAT), fuel value, turbocharger speed, vibration parameter, deflection parameter, engine

horsepower, wheel slip and mass air flow at the air intake manifold (See Figure 1).

However, Bowman fails to disclose a fuel controller for supplying diesel fuel to the engine cylinders.

Venema teaches that it is conventional in the art of controlling surge in air compressor driven system, to utilize a fuel controller (15, 16) for supplying diesel fuel (13) to the engine cylinders (11,12) (See Figure 5).

It would has been obvious to one having ordinary skill in the art at that time the invention was made, to have utilized a fuel controller for supplying diesel fuel to the engine cylinders, as taught by Venema, to improve the efficiency and performance of the Bowman locomotive turbocharged engine.

Allowable Subject Matter

Claims **18-22**, and **34** are allowed.

Claims **3, 8-13, 29, 30, and 32** are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is an examiner's statement of reasons for allowance: The prior art fails to disclose or render obvious the claimed combination for improving an apparatus to control a locomotive engine operating at a plurality of discrete speeds including:

" Regarding claim 18:

the engine control system is responsive to the sensor signal and increases the speed of the diesel engine from a first discrete speed at which the diesel engine is operating to a higher discrete speed when a change in the sensor signal overtime indicates a surge event of the turbocharger.

Regarding claim 22:

the engine control system is responsive to the sensor signal and increases the speed of the diesel engine when the sensor signal indicates two surge events within a defined period of time.

Regarding claim 34:

*monitoring for a further surge event after increasing the speed of the engine and within a predetermined period of time; and
generating a signal indicative of a surge event when a further surge event occurs during the predetermined period of time."*

Conclusion

The IDS (PTO-1449) filed on October 21, 2003 has been considered. An initialized copy is attached hereto.

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

- Allen et al.(US Patent Number 6,609,375 B2) disclose an electric assisted turbocharger.

- Sun et al. (US Patent Number 6,434,938 B1) disclose a control strategy for a turbocharged engine.
- Mader et al. (US Patent Number 6,715,289 B2) disclose a turbocharged internal combustion engine having a MAP sensor 28 being a strain gauge.
- Burger et al. (Pub. Number DE 28 49 054 A1) disclose an inlet manifold pressure sensor for an internal combustion engine using a corrugated membrane cell acting on a spring plate carrying strain gauges.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thai-Ba Trieu whose telephone number is (703) 308-6450. The examiner can normally be reached on Monday - Thursday (6:30-5:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thomas E. Denion can be reached on (703) 308-2623. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only.

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For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

TTB
July 7, 2004



Thai-Ba Trieu
Patent Examiner
Art Unit 3748